¡PAIRGAIN
THE CopperOptics COMPANY

TA-RS19970418

Revision 1
Jan 12, 1999

HIGAIN TECHNICAL ADVISORY

MODEL: All HiGain Line Units

PART NUMBER: Several

CLEI: Several

SUBJECT: Frame vs. Unframed Mode

All HiGain line units (HLU) have a user option called FRMG. The option has both an AUTO (the default choice) and an UNFR setting. In the AUTO mode HiGain continuously searches the T1 inputs at both the HLU & HRU ends for a valid SF or ESF frame pattern. When either pattern, is detected, HiGain displays (ESF or SF) in the span status screens as well as in the HLU 4 character display during the scroll mode and in the HRU front panel FRM LED. This frame information allows HiGain to determine the DS0 slot boundaries as well as the location of all the frame bits. This mode is required for the following reasons:

1. Fractional T1 Applications These applications use the DS0 blocking option. This option requires HiGain to know the DS0 boundaries so that it can insert the FF idle pattern in the blocked slots positions.

2. ESF Data Link Applications. HiGain can respond to the network loopup and loopdown codes that are imbedded in the ESF data link. Knowledge of the frame boundaries is required to detect these codes.

3. Single Pair Survivability: HiGain transmits the frame bits on each of the two HDSL loops. Thus if communication is lost on one loop, the remaining 12 DS0s on the surviving loop can be recovered since the frame bits are also available from this loop. The frame bits must be known to support this feature.

In the UNFR mode, HiGain does not examine the payload for frame patterns and so is "frame blind". Thus it can not support any of the above 3 features. In lieu of the unknown frame bits, it picks the 193rd bit at random and transmits it over both of the HDSL loops.

Some T1 systems have proprietary frame patterns which are close to but not exactly like the standard SF & ESF patterns. When set to its AUTO mode, HiGain can sometimes confuse these pseudo SF & ESF patterns for the real SF & ESF patterns. Whenever HiGain finds this "valid" frame pattern, it resets its frame pointing arrows. This causes a temporarily realignment of its data buffers which cause a short burst of T1 errors. But HiGain soon determines that this is indeed not a valid frame pattern and begins anew its search for the right pattern which it finds and then again rejects. This search, find and reject process is repeated over and over again accompanied by a burst of errors each cycle. The following systems are known to generate these pseudo frame patterns and thus cause bit errors when used with HiGain.

1. Northern Telecom SL1 PBXs
2. AT&T SLC Series 5 DLCs
3. AT&T Series 2000 DLCs
4. Ericsson Cellular Site Radio Base Station Equipment

HiGain must be provisioned to is UNFR mode to avoid these bit errors when used to provide transport access to any of these systems. When so provisioned, HiGain will not support the above three applications that require the AUTO mode. Note that the UNFR mode has no other negative effects on the operation of the HiGain system. All of its other functions, such as loopback responses, work equally alike in both the AUTO and UNFR modes.

The HLU-231, List 3, issue 2 and the HLU-231, List 3D line units have their FRMG default option set to UNFR. The UNFR mode is called the THRU mode in some models of the HLU.